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CLOUD LABORATORY IN SPACE TO STUDY EARTH WEATHER

The old saying, "Everyone talks about the weather, but nobody does anything about it" may soon be put to rest by space age engineers and scientists. NASA and the General Electric Co., Valley Forge, Pa., are planning to build a special weather laboratory that will be carried into space by the Space Shuttle and its Spacelab in the early 1980s to study the causes of weather here on Earth. NASA and General Electric are expected to sign a \$5.6 million contract to build the laboratory called the Atmospheric Cloud Physics Laboratory (ACPL) this week. The space agency chose General Electric to negotiate a contract for the work in June.

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In the weightless environment of space, this highly sophisticated automated laboratory will be able to perform weather experiments that have not been possible on Earth.

Years of study have yielded a wealth of data on weather phenomena, but scientists have never been able to study properly the minute physical processes of cloud formation. Earth's gravity distorts experiments and renders the results incomplete.

Now, NASA may have found a way to help these scientists fill in some of the blanks.

Charles R. Ellsworth, manager of the cloud physics laboratory task team at NASA's Marshall Space Flight Center, Huntsville, Ala., explains two of the problems caused by gravity in Earth-bound laboratories:

"In an experimental cloud chamber on Earth, drops form and fall out of sight so quickly that they cannot be observed properly. In space, without the pull of gravity, the drops form and remain suspended so that the formation process can be observed as long as necessary.

"Convection, or movement of air or fluid, is an effect of gravity that occurs in cloud chambers when temperature differences are present, such as a higher temperature on one side of the chamber. This effect distorts the cloud formation procedure. Convection does not occur when there is no gravity.

"This new laboratory operating in orbit will essentially eliminate problems caused by gravity," he concludes, "and allow scientists to study the microphysical processes of cloud formation without that hindrance."

NASA has selected eight of 26 experiment proposals submitted by the scientific community to be performed in the ACPL on early Spacelab missions. The laboratory will remain in Spacelab during the mission and return to Earth with data from the experiments. The ACPL can be used many times on such missions, giving other scientists an opportunity to carry out different experiments and research leading toward their ultimate goal of controlling local weather.

Scientists whose experiments will be performed on the first mission are:

Prof. Warren C. Kocmond, executive director of the Energy and Atmospheric Environment Center, University of Nevada, Reno.

Dr. Donald E. Hagen, assistant professor at the Graduate Center for Cloud Physics Research, University of Missouri, Rolla.

Dr. Patrick Squires, director of the Convective Storms Division, National Center for Atmospheric Research, Boulder, Colo.

Dr. Bernard J. Anderson, cloud physicist in the Space Sciences Laboratory, Marshall Space Flight Center.

Scientists whose experiments will be performed on subsequent missions are:

Dr. Larry R. Eaton, program scientist for the ACPL Program at General Electric Co., Philadelphia, Pa.

Dr. Gabor Vali, professor at the Department of Atmospheric Science, University of Wyoming, Laramie.

Dr. Clive Saunders, professor in the Physics Department at the University of Manchester, England.

Prof. Peter Hobbs, professor in the Atmospheric Sciences Department, University of Washington, Seattle.